

What is claimed is:

1. A method for producing a fungal antigen suitable for testing for an antibody to a fungus, the method comprising:

5 a) providing a fungal antigen as a culture filtrate, the fungal antigen having not been purified by ion exchange chromatography or isoelectric focusing from the culture filtrate; and

b) contacting the fungal antigen with an oxidizing agent to produce an oxidized fungal antigen suitable for testing an antibody to the fungus.

10 2. The method of claim 1, wherein the fungus is selected from the group consisting of a mitosporic Trichocomaceae, an Onygenaceae and a mitosporic Onygenale.

15 3. The method of claim 1, wherein the fungus is selected from the group consisting of *Aspergillus*, *Blastomyces* (*Ajellomyces*), *Coccidioides*, *Histoplasma*, *Blastocystis* and *Candida*.

20 4. The method of claim 3, wherein the *Aspergillus* is *Aspergillus fumigatus*.

5. The method of claim 3, wherein the *Blastomyces* is *Blastomyces dermatitidis*.

25 6. The method of claim 3, wherein the *Coccidioides* is *Coccidioides immitis*.

7. The method of claim 3, wherein the *Histoplasma* is *Histoplasma capsulatum* or *Histoplasma duboifi*.

30 8. The method of claim 1, wherein the fungal antigen has not been purified from the culture filtrate.

9. The method of claim 1, further comprising a step of concentrating the culture filtrate.

10. The method of claim 1, further comprising a step of enzymatically deglycosylating the fungal antigen.

11. The method of claim 1, wherein the oxidizing agent inactivates the cross-reactive carbohydrate moiety of the fungal antigen but does not disturb the structural integrity or antigenicity of the non-carbohydrate moieties.

12. The method of claim 11, wherein the fungal antigen is a glycosylated protein or peptide and the oxidizing agent inactivates the cross-reactive carbohydrate moiety of the fungal antigen but does not disturb the structural integrity or antigenicity of the proteineous or peptidyl moiety.

13. The method of claim 1, wherein the oxidizing agent is periodate.

14. The method of claim 1, further comprising a step of attaching the oxidized fungal antigen to a surface of a device suitable for testing an antibody to a fungus.

15. The method of claim 14, wherein the device is selected from the group consisting of a microtiter plate, a glass slide, a nitrocellulose membrane, a latex bead, a cell, a test tube, a plastic bead, a colloidal gold particle, a colored particle, a magnetic bead and a quantum dot.

16. A fungal antigen suitable for testing an antibody to a fungus, which antigen is produced by the method of claim 1.

17. A device suitable for testing an antibody to a fungus, which device is produced by the method of claim 14.

18. A method of testing an antibody to a fungus in a sample, the method comprising:

a) producing a fungal antigen suitable for testing an antibody to a fungus, comprising providing a fungal antigen as a culture filtrate, the fungal antigen having not been purified by ion exchange chromatography or isoelectric focusing from the culture filtrate, and contacting the fungal antigen with an oxidizing agent to produce an oxidized fungal antigen suitable for testing an antibody to the fungus;

b) contacting a sample suspected of containing an antibody to a fungus with the oxidized fungal antigen produced in step a) under suitable conditions to allow binding of the antibody, if present in the sample, to the oxidized fungal antigen; and

c) assessing binding between the antibody and the oxidized fungal antigen to determine the presence and/or amount of the antibody in the sample.

19. The method of claim 18, wherein the fungus is a pathogenic fungus.

20. The method of claim 18, wherein the sample is a clinical sample.

21. The method of claim 20, wherein the clinical sample is a human clinical sample.

22. The method of claim 18, wherein the fungal antigen has not been purified from the culture filtrate.

23. The method of claim 18, wherein the oxidizing agent is periodate.

24. The method of claim 18, further comprising a step of attaching the oxidized fungal antigen to a surface of a device suitable for testing an antibody to a fungus before contacting the antigen with the sample.

25. The method of claim 18, wherein the binding between the antibody and the oxidized fungal antigen is assessed by a sandwich or competitive assay format.

26. The method of claim 18, wherein the binding between the antibody and the oxidized fungal antigen is assessed by a format selected from the group consisting of an enzyme-linked immunosorbent assay (ELISA), immunoblotting, immunoprecipitation, radioimmunoassay (RIA), immunostaining, latex agglutination, indirect hemagglutination assay (IHA), complement fixation, indirect immunofluorescent assay (IFA), nephelometry, flow cytometry assay, chemiluminescence assay, lateral flow immunoassay, u-capture assay, inhibition assay and avidity assay.

27. The method of claim 18, wherein the binding between the antibody and the oxidized fungal antigen is assessed by an ELISA format.

28. A method for producing an antibody to a fungal antigen, the method comprising:

- a) producing a fungal antigen comprising providing a fungal antigen as a culture filtrate, the fungal antigen having not been purified by ion exchange chromatography or isoelectric focusing from the culture filtrate, and contacting the fungal antigen with an oxidizing agent to produce an oxidized fungal antigen;
- b) delivering, to a vertebrate or tissue culture, the oxidized fungal antigen, in an amount sufficient to induce detectable production of an antibody to the antigen; and
- c) recovering the antibody from the vertebrate or tissue culture.

29. The method of claim 28, wherein the oxidizing agent is periodate.

30. The method of claim 28, wherein the vertebrate is a non-human mammal.

31. An antibody to a fungal antigen, which antibody is produced by the method of claim 28.

32. The antibody of claim 31, which is a polyclonal antiserum.

33. A method for producing a monoclonal antibody to a fungal antigen, the method comprising:

a) producing a fungal antigen comprising providing a fungal antigen as a culture filtrate, the fungal antigen having not been purified by ion exchange chromatography or isoelectric focusing from the culture filtrate, and contacting the fungal antigen with an oxidizing agent to produce an oxidized fungal antigen;

b) delivering, to a vertebrate or tissue culture, the oxidized fungal antigen, in an amount sufficient to induce detectable production of an antibody to the antigen;

c) removing at least a portion of antibody-producing cells from the vertebrate or tissue culture;

d) immortalizing the removed antibody-producing cells;

e) propagating the immortalized antibody-producing cells; and

f) harvesting monoclonal antibody produced by the immortalized antibody-producing cells.

34. An monoclonal antibody to a fungal antigen, which monoclonal antibody is produced by the method of claim 33.

35. A hybridoma capable of producing a monoclonal antibody to a fungal antigen, the hybridoma is produced by steps a)-d) of the method of claim 33.

36. A method of testing for a fungal antigen in a sample, the method comprising:

a) providing an anti-fungal polyclonal antiserum produced by the method of claim 32;

b) contacting a sample suspected of containing a fungal antigen with the polyclonal antiserum under suitable conditions to allow binding of the fungal antigen, if present in the sample, to the polyclonal antiserum; and

c) assessing binding between the fungal antigen and the polyclonal antiserum to determine the presence and/or amount of the fungal antigen in the sample.

37. A method of testing for a fungal antigen in a sample, the method comprising:

a) providing an anti-fungal antigen monoclonal antibody produced by the method of claim 35;

5 b) contacting a sample suspected of containing a fungal antigen with the monoclonal antibody under suitable conditions to allow binding of the fungal antigen, if present in the sample, to the monoclonal antibody; and

c) assessing binding between the fungal antigen and the monoclonal antibody to determine the presence and/or amount of the fungal antigen in the sample.

10 38. A device for simultaneously testing for a plurality of fungal antibodies, the device comprising a plurality of fungal antigens produced by the method of claim 1 attached to a surface of the device suitable for testing an antibody to a fungus, wherein the plurality of fungal antigens are attached to areas of the surface that are physically
15 distinct from each other.

39. The device of claim 38, which device comprises an immunoblot and wherein the plurality of fungal antigens are attached to separate stripes in the immunoblot.

20 40. The device of claim 38, which device comprises an IFA well and wherein the plurality of fungal antigens are attached to different spots within the IFA well.

25 41. The device of claim 38, which device comprises an IFA slide and wherein the plurality of fungal antigens are attached to different wells of the IFA slide.

30 42. The device of claim 38, which is selected from the group consisting of a microtiter plate, a glass slide, a nitrocellulose membrane, a latex bead, a cell, a test tube, a plastic bead, a colloidal gold particle, a colored particle, a magnetic bead and a quantum dot.

43. A device for testing for a fungal antigen, the device comprising an anti-fungal antibody produced by the method of claim 28 attached to a surface of the device.

44. A device for testing for a fungal antigen, the device comprising an anti-fungal monoclonal antibody produced by the method of claim 33 attached to a surface of the device.

45. A device for simultaneously testing for a plurality of fungal antigens, the device comprising a plurality of antibodies produced by the method of claim 28 attached to a surface of the device suitable for testing for a fungal antigen, wherein the plurality of fungal antibodies are attached to areas of the surface that are physically distinct from each other.

46. A device for simultaneously testing for a plurality of fungal antigens, the device comprising a plurality of monoclonal antibodies produced by the method of claim 33 attached to a surface of the device suitable for testing for a fungal antigen, wherein the plurality of fungal antibodies are attached to areas of the surface that are physically distinct from each other.